

**MARK SCHEME for the May/June 2010 question paper  
for the guidance of teachers**

**5129 COMBINED SCIENCE**

**5129/02**

Paper 2 (Theory), maximum raw mark 100

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

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	GCE O LEVEL – May/June 2010	5129	02

- 1 (a) correct symbol  
in parallel with  $6\Omega$  resistor [2]
- (b) (i)  $V = IR$  (or equivalent) or  $0.2 \times 6$   
= 1.2  
V (unit independent) [3]
- (ii) 9 [1]
- 2 (a) magnesium **and** aluminium / Mg and Al  
metals [2]  
(answers are independent)
- (b) blue / purple / violet  
red / orange / yellow [2]
- (c) same number of / 2 electrons in outermost shell  
(allow valence electrons) [1]
- 3 (a) (i) 0 and 1 [1]
- (ii) 2 and 3 [1]
- (iii) 3 and 4 [1]
- (b) iris / circular and/or radial muscles [1]
- (c) a line which remains above the drawn line throughout  
(can be along initial line but must not increase) [1]
- (d) retina [1]
- 4 (a) 27 [1]
- (b) electron / e [1]
- (c) 32 [1]
- (d) an indication of 2 half lives  
= 11 400 [2]  
 $2 \times 5700$  with incorrect answer = 1 mark

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- 5 liver  
amino acids  
kidneys  
liver [4]
- 6 (a) neutralisation [1]
- (b) 17  
80 [2]
- (c)  $(17 \times 2) / 80$   
 $= 0.425 \text{ kg} / 425 \text{ g}$   
(ecf from 6b)) [2]
- 7 (a) matt / black is a better emitter / radiator (of thermal radiation)  
or shiny / white is a poorer emitter / radiator [1]
- (b) conduction [1]
- (c) convection  
heated air expands  
heated air is less dense } any one [1]
- 8 (a) filter  
add chlorine  
sedimentation } any two [2]
- (b) remove solids / insoluble particles / dirt  
kill bacteria / micro-organisms  
solids settle to the bottom [2]
- 9 (a) X = palisade / mesophyll  
Y = (lower) epidermis [2]
- (b) spongy mesophyll [1]
- (c) by diffusion  
through stomata [2]
- (d) diffusion over short distance / easily diffuse  
light penetrates to all parts / more light readily absorbed [2]

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- 10 (a)** no yes no yes  
4 = 2 marks 3 = 1 mark [2]
- (b) (i)** plastic [1]
- (ii)** iron / Fe [1]
- 11 (a)** haematite / magnetite [1]
- (b) (i)** 3 2 3  
(allow correct multiples) [1]
- (ii)** removal of oxygen / gain of electrons / lower oxidation state [1]
- (iii)** coke / carbon burns to form carbon dioxide  
carbon dioxide reacts with carbon [2]  
carbon reacts with oxygen = 1 mark
- (c)** too reactive / more reactive than iron / carbon [1]
- 12 (a) (i)** 60
- (ii)** 8 (ignore any sign) [2]
- (b)** oscillation / disturbance / displacement / motion of particles  
perpendicular to the direction / motion of the wave [2]
- 13 (a)** break down of large pieces to small pieces /  
crush / tear / grind food  
increase surface area  
mix food with saliva / enzymes  
make swallowing easier  
(ignore references to chewing / digestion) } any two [2]
- (b)** B (correctly identified)  
fewer decayed teeth / less decay [1]
- (c) Town B :**  
eat less sugar  
have better dental care / more clinics / dentists  
brush teeth more  
visit dentist more regularly  
use more mouthwash  
eat more fruit and vegetables  
better education } any two [2]
- accept converse in terms of town A**

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- 14 (a) infra red / ir [1]
- (b) radio [1]
- (c) 300 000 000 /  $3 \times 10^8$  [1]
- 15 (a) carbon dioxide  
           plants           animals [3]
- (b) X = photosynthesis  
       Y = respiration  
       Z = decay / decomposition / (bacterial) respiration [3]
- 16 (a) D [1]
- (b) B [1]
- (c) C [1]
- 17 (a) time = distance/speed or 0.8/0.2  
       4.0 [2]
- (b) work = force  $\times$  distance or 4  $\times$  0.8  
       3.2  
       J / joules       (unit independent) [3]
- 18 (a) carbon dioxide  
       water / steam (any order) [2]
- (b) carbon monoxide  
       poisonous / toxic / correct description of mode of action [2]
- (c) same general formula  
       similar **chemical** properties  
       gradation in **physical** properties  
       formulae differ by CH<sub>2</sub>       } any one [1]

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- 19 (a) potential / gravitational  
kinetic / movement [2]
- (b) 0.5 [1]
- 20 (a) (i) any date from Feb 28 to Mar 5 [1]  
(ii) any date from Mar 10 to Mar 17 [1]
- (b) (i) 28 days / 4 weeks [1]  
(ii) age / menopause  
stress / emotional state / anxiety  
diet / malnutrition / starvation  
pregnancy / breast feeding  
exercise  
genetic factors / inheritance } any 2 [2]
- 21 (a) fermentation / anaerobic respiration [1]  
(b) (i) provides enzymes [1]  
(ii) prevents oxidation of ethanol / formation of ethanoic acid [1]  
(c) (fractional) distillation [1]  
(d) correct structure of ethanol [1]